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# Evaluating IR Platforms: Usability Criteria for End Users and IR Managers

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As managers of electronic resources, librarians must be concerned with "user-friendliness" in two senses — the public user interface (PUI) where end users of all types interact, and the administrative interface (sometimes referred to as the "back end") where library personnel execute most of the critical database and configuration work. These separate but equally important aspects of any library platform demand different tool capabilities and have completely different sets of stakeholders.

Institutional Repositories (IRs) are a "set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members."[1] While Institutional Repositories have faced some well-deserved criticism over the years[2] and do not benefit from a very intuitive title,[3] they remain a common service that many libraries today at institutions of higher education choose to provide.

As technology platforms, IRs are no exception to the two-sided usability concerns described above. IR end users represent "information seekers" and these users, like other online searchers, basically "want to find information quickly and with a minimum fuss."[4] In contrast, administrators or managers of IR systems represent a group of "data maintainers"[5] and might be better described as IR superusers. These "maverick managers"[6] create metadata and documentation, upload most content, make quality assurance decisions, communicate with contributors, control website configuration settings, and generally oversee the IR's collections on behalf the entire institution.

Of course, in the context of IRs, there is a third group to consider — authors/submitters. This group is not looking for information as a part of a research investigation, but rather is depositing content into the system as an institutional contributor. Thanks to over a decade of devoted librarians and their research, we actually know quite a bit about authors/submitters as IR users and stakeholders.[7]

Comparatively, we know far less about what end users ("information seekers") and IR mangers ("data maintainers") desire in an IR platform and interface. While usability has been a concern and point of study in the world of IRs since their nascency, there has yet to be a consensus about what kind of usability criteria might set the standard for the variety of IR platforms out there on the market today. In addition, some of the previously proposed usability heuristics could use an update.[8]

As a digital archivist, IR manager, and usability researcher I would like to take this opportunity to return to these earlier conversations about IR usability and offer some further criteria of my own that I believe librarians today can use to critically evaluate their IR platforms. I make a special effort here to consider the desires of end users and IR managers alike.

### What do they ("information seekers") want?

**Kim's** pioneering work on IR usability lays out a set of seven criteria for evaluating IR interfaces.[9] While **Kim** conducted his study in the early days of IR platform development, many of his guidelines for user-friendly IR navigation are easily updated to fit the demands of current IR interfaces (see numbers 1-7 below). **Jakob Nielsen's** famous ten usability heuristics, which still serve as an industry standard, were the basis for much of **Kim's** work, and are, therefore, also well represented in these ten criteria.[10]

1. Users are given multiple ways to search
2. Users are provided sufficient visual cues and guidance for searches
3. The interface employs the users' language, not specialized jargon
4. Users are afforded a high level of control and freedom when navigating
5. Search result listings include useful metadata descriptors for each resource (but avoid information overload)
6. The user can browse a diversity of content in meaningful ways
7. Links to open digital content are centrally located and clearly presented to users
8. The contents of the site are highly visible and discoverable on the open web
9. The interface offers a pleasing aesthetic and minimalist design
10. Appropriate Web 2.0 features enhance interface functionality

How do we know these criteria serve the needs of information seekers? They told us. In a 2011 study of IR users, researchers discovered user dissatisfaction or frustration with several key usability elements.[11] Reported usability obstacles and the tasks they are associated with help us understand what end users really value in an IR interface.[12] For example, **St. Jean's** study cited poor browsability as a major obstacle in IRs, hindering those users attempting general search strategies as opposed to known-item searches.[13] Others simply expressed disappointment with the overall layout or organization of the IR, and similar studies have concurred that IR interfaces tend to lack basic functionalities and pose a steep learning curve for new users.[14] At an even more elementary level, many interviewees in the 2011 study were uncertain about "what exactly constitutes an IR" and they lacked the vocabulary required to explore it fully.[15]

In addition to website functionality, end users in the same study cited the IR's lack of overall visibility on the web as a serious hindrance and suggested this as the reason for why few of their peers knew or used the IR website.[16] Other studies have likewise listed discoverability as a critical aspect of IR interaction.[17] Search engine indexing and optimization (SEO) has instigated a critical turn for IR in this area, placing IR content in the hands of any online searcher rather than limiting it to a single institution in a kind of "information island."[18]

Furthermore, some end users indicated that IRs did not align to their standards of an attractive, modern website.[19] Users were disappointed with an overall lack of Web 2.0 components and researchers suggested this as a major opportunity for future development.[20] Of course, if we fast forward to today, we see that our end users have even higher hopes for the kind of usability enhancements they expect from a website. Everything from tagging and "favoriting" to auto-complete search boxes and pop up tool tips are basic elements in a 2018 web user's repertoire. In sum, our users' bar for online research tools is high, and, therefore, if we hope to satisfy their expectations, our usability criteria must be rigorous.

### What do we ("data maintainers") want?

The question remains, what do *we* as IR administrators want for *our* IR interface? What are the features and capabilities that promote *our* efficiencies and ease of use? Even less has been articulated in the scholarship around this topic. In 2007, **McKay** outlined six major issues facing IR "data maintainers."[21] Informed by **McKay's** recommendations, and based on my own everyday interactions with the "back end" of an IR, I have outlined the following criteria (or perhaps it is more of a wish list!) of desirable administrative interface capabilities in IR platforms.

1. Useful and clear terminology, consistent with profession-specific vocabularies
2. Streamlined submission workflows with the ability to tailor steps according to submission type
3. Appropriate and reasonable metadata requirements
4. Autoformatting and other authority control measures to ensure "clean" data input
5. Permission-based viewing, editing, and content suppression options

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6. Robust usage statistics and research reporting capabilities
7. Built-in system communications and an audit log for each record
8. Responsive to submission editing and content removal decisions
9. Accepts and supports a diversity of file types and media formats
10. Flexible and customizable website configuration

What research can lend credibility to this extensive list of demands? While there is admittedly a dearth of information about the library community's expectations for IR administrative interfaces, **Cunningham** has made an effort to collect feedback from librarians involved in content acquisition, data input, quality assurance, and other IR processes.[22] In her study, she noticed that librarian IR managers were bogged down in the details of lengthy data entry workflows that significantly prolonged the deposit process.[23] These data wranglers had confusion and disagreement about which fields were mandatory and were frustrated by poor data error reporting due to unclear system wording. Other "slow-downs" reported by librarians included a lack of default options and the absence of any help features like example entries.[24]

According to **Cunningham**, correctness of entries was a real concern for librarians who complained that there were no authority controls to ensure consistency in capitalization, name and date formatting, or other standard data types across an entire IR. Librarians also felt hamstrung when trying to revise, revisit, or remove content in the IR; workflows only seemed to "flow" one way and making changes to content was a chore. Other workflow complaints involved poor communication with authors, uncertainly about what stage a submission was in at any given time, and a lack of clarity about the roles and privileges of other IR users. Librarians also recognized that usage stats and research analysis tools could potentially help in achieving faculty buy-in with IRs, yet those components of the IR interface in question were found to be very limiting.[25]

In my own experience with IR administrative interfaces, I value system flexibility and customization above all else. Scholarly output is moving beyond the realm of the traditional manuscript or journal article, and since graduate students are far more likely than established faculty to utilize IRs as a research tool or publishing platform, IRs should be particularly responsive to cutting edge research trends like digital humanities products and multimedia scholarship.[26] Today's IRs must support a range of different non-text resources — datasets, audio files, streaming video, maps and coordinates, high resolution images, archival and museum artifacts, and even software.[27] Therefore, IR managers must be able to tweak submission workflows, alter required fields, and provide specialized instructions to both submitters and end users according to the media type and format being deposited.

Finally, good IR managers know that they are more than just "data maintainers"; they are also publicists and web managers, wielding the full power of their institutional brand. As such, they want to be able to control, not just how collection contents are processed, but also how they are presented on the open web.

## Using the Criteria

While there is not enough space herein to evaluate a particular IR platform based on the criteria I have proposed, I sincerely hope that other IR managers will pick up where I leave off with this discussion about IR usability. If we can come to a consensus about what the most valuable features of an IR interface might be, we can put pressure on our vendors and ask more of our tools, improving our web spaces and services in the long run. Librarians, how do your current IR platforms measure up? Do the criteria presented here check all the boxes of your use case? Are there critical requirements that I have overlooked? Furthering this discussion will require conversation, comparisons, and competitive analyses.

**Endnotes**

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4. **Dana McKay**, "Institutional Repositories and Their 'Other' Users: Usability Beyond Authors," *Ariadne* 52 (2007): *http://www.ariadne.ac.uk/issue52/mckay/*.
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8. **Jihyun Kim**, "Finding Documents in a Digital Institutional Repository: DSpace and Eprints," *Proceedings from the American Society of Information Science and Technology*, 42 (2005): *doi:10.1002/meet.1450420173*.
9. Ibid. [Note: **Kim's** original 7 criteria were: "(1) give users an adequate number of search options; (2) provide examples of search query; (3) employ users' language; (4) allow users greater control and freedom; (5) display useful components in result sets; (6) list search results in a useful way; and (7) clearly present links to open digital documents. Implementing these guidelines would improve the user's experiences when using digital institutional repositories."]
10. **Jakob Nielsen**, "10 Usability Heuristics for User Interface Design," *Nielson Normal Group*, 1995, *https://www.nngroup.com/articles/ten-usability-heuristics/*.
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12. More recent scholarship has shown how developing user profiles can help us understand typical needs, tasks, and problems encountered by different kinds of end users. See **Maha ALjohani** and **James Bluestein**, "Personas Help Understand Users' Needs, Goals, and Desires in an Online Institutional Repository," *International Journal of Computer and Information Engineering* 9, no.2 (2015): 631-632.
13. Ibid., 30. Searching and browsing was also a major usability issue cited in **Hyun Hee Kim** and **Yonh Ho Kim**, "Usability Study of Digital Institutional Repositories," *The Electronic Library* 26, no. 6 (2008): 863-881.
14. **St. Jean**, "Unheard Voices," 30; **Philip Davis** and **Mathew Connolly**, "Institutional Repositories: Evaluating the Reasons for Non-use of Cornell University's Installation of DSpace," *D-Lib Magazine* 13, no. 3/4 (2007): *http://www.dlib.org/dlib/march07/davis/03davis.html*.
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16. Ibid., 30.
17. **Davis** and **Connolly**, "Institutional Repositories: Evaluating the Reasons for Non-use… ."
18. Ibid.; **Jennifer Howard**, "Digital Repositories Foment a Quiet Revolution in Scholarship," *The Chronicle of Higher Education* 56, no. 38 (2010).
19. **St. Jean**, "Unheard Voices," 35; **Hyun Hee Kim** and **Yonh Ho Kim**, "Usability Study of Digital Institutional Repositories," 868.
20. **St. Jean**, "Unheard Voices," 40.
21. **McKay**, "Institutional Repositories and Their 'Other' Users… ." **McKay** cited the following challenges for IR administrators: (1) confounding terminology; (2) inefficient and confusing deposit or editing processes; (3) unreasonable metadata requirements; (4) insufficient formatting and authority controls; (5) the inability to suppress content or control privacy settings; and (6) less-than-helpful data gathering capabilities for the purposes of research reporting or usage statistics.
22. **Sally Jo Cunningham**, "An Ethnographic Study of Institutional Repository Librarians: Their Experiences of Usability," *Proceedings from the Open Repositories Conference,* San Antonio, TX (2007).
23. Ibid. A 2006 **University of Michigan** usability study showed similar frustrations for IR administrators who found data entry and data editing pages "very long and undifferentiated visually, so finding the place to make changes can be difficult." See **Jim Ottaviani**, "University of Michigan DSpace (a.k.a. Deep Blue) Usability Studies: Summary," (2006): 6. *http://deepblue.lib.umich.edu/bitstream/2027.42/40249/1/Deep_Blue(DSpace)_usability_summary.pdf*
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